

CANCER RESEARCH

*A Monthly Journal of Articles and Abstracts
Reporting Cancer Research*

VOLUME THREE

THE OFFICIAL ORGAN

of the

AMERICAN ASSOCIATION FOR CANCER RESEARCH, INC.

PHILADELPHIA

THE INTERNATIONAL CANCER RESEARCH FOUNDATION

1943

CANCER RESEARCH

This journal is sponsored by the American Association for Cancer Research, Inc., The Anna Fuller Fund, The International Cancer Research Foundation, and The Jane Coffin Childs Memorial Fund for Medical Research.

Advisory Board

MILDRED W. S. SCHRAM, *Chairman*
S. BAYNE-JONES JAMES B. MURPHY
C. C. LITTLE GEORGE M. SMITH

Editorial Committee

JAMES B. MURPHY, *Chairman* WM. H. WOGLOM, *Secretary*
CLARA J. LYNCH, *Editor, Abstracts Section*

JOHN J. BITTNER	JACOB FURTH	M. J. SHEAR
ALEXANDER BRUNSCHWIG	WILLIAM U. GARDNER	HAROLD L. STEWART
GIOACCHINO FAILLA	FRANCES L. HAVEN	GRAY H. TWOMBLY
LOUIS F. FIESER	BALDUIN LUCKÉ	SHIELDS WARREN

Abstractors

W. A. BARNES	MARIE DURAN-REYNALS	V. F. MARSHALL
S. BAYNE-JONES	M. J. EISEN	W. V. MAYNEORD
M. BELKIN	W. E. GYE	J. L. MELNICK
JOHN J. BITTNER	A. HADDOW	C. A. PFEIFFER
E. BOYLAND	J. B. HAMILTON	E. C. RICHARDSON
R. W. BRIGGS	FRANCES L. HAVEN	R. C. ROSKELLEY
W. J. BURDETTE	I. HIEGER	D. SHEMIN
A. CLAUDE	G. H. HOGEBOOM	E. E. SPROUL
P. P. COHEN	M. E. HOWARD	K. G. STERN
A. CORNELL	R. N. JONES	C. WARREN
H. G. CRABTREE	E. L. KENNAWAY	F. L. WARREN
H. J. CREECH	J. G. KIDD	H. GIDEON WELLS
M. R. DEDDISH	A. KIRSCHBAUM	H. Q. WOODARD
C. E. DUNLAP	R. J. LUDFORD	G. W. WOOLLEY

Published by The International Cancer Research Foundation.

Publication Office, 1500 Greenmount Ave., Baltimore 2, Maryland.

The annual subscription rates for one volume are: To members of the American Association for Cancer Research, Inc., \$5.00; to others and to libraries, institutions, and organizations, \$7.00. Business communications, remittances, and subscriptions should be addressed to Robert W. Briggs, Business Manager, 1500 Greenmount Ave., Baltimore 2, Md., or 2500 Lincoln-Liberty Building, Philadelphia 7, Pa.

No responsibility is accepted by the Committee, by the Board, or by the Publishers of *Cancer Research* for opinions expressed by contributors.

Entered as second class matter February 12, 1941, at the Post Office at Baltimore, Md., under the Act of March 3, 1879.

Copyright, 1943, by The International Cancer Research Foundation.

SEE INSIDE BACK COVER FOR INFORMATION FOR CONTRIBUTORS

Contents of Volume 3

JANUARY, 1943. NUMBER 1

JANET BLOCH BRIGGS and ROBERT W. BRIGGS. The Effects of a Water-Soluble Carcinogen on Early Frog Development.....	1
WALTER J. BURDETTE and LEONELL C. STRONG. The Inheritance of Susceptibility to Tumors Induced in Mice. I. Tumors Induced by Methylcholanthrene in Five Inbred Strains of Mice.....	13
LEONELL C. STRONG, V. J. COLLINS, and E. A. DURAND. A Genetic Analysis of the Induction of Tumors by Methylcholanthrene. IV. The Probable Remote Induction of Various Types of Gastric Lesions.....	21
V. J. COLLINS, W. U. GARDNER, and L. C. STRONG. Experimental Gastric Tumors in Mice....	29
WILLIAM CRAMER and ROBERT E. STOWELL. Skin Carcinogenesis by a Single Application of 20-Methylcholanthrene.....	36
J. LAURIDSEN and H. E. EGGERS. Carcinogenesis after Multiple Irritation.....	43
ARTHUR M. CLOUDMAN. Reactions of Hybrid and Parabiontic Pseudo-Hybrid Mice to Inoculations of Tumor C198.....	47
HARRY S. N. GREENE and WADE H. BROWN. A Transplantable Squamous Cell Carcinoma in the Rabbit.....	53
JACOB HEIMAN. Comparative Effects of Estrogen, Testosterone, and Progesterone on Benign Mammary Tumors of the Rat.....	65
ABSTRACTS.....	70-72
Reports of Experimental Research.....	70-71
Clinical and Pathological Reports.....	71-72

FEBRUARY, 1943. NUMBER 2

F. DICKENS and H. WEIL-MALHERBE. The Metabolism of Normal and Tumor Tissue. XX. A Comparison of the Metabolism of Tumors of Liver and Skin with That of the Tissue of Origin.....	73
R. G. CHITRE and V. R. KHANOLKAR. Studies in Esterase (Butyric) Activity. II. Esterase Content of Livers of Mice and Its Excretion in Strains Susceptible or Insusceptible to Mammary Cancer.....	88
W. U. GARDNER. Testicular Tumors in Mice of Several Strains Receiving Triphenylethylene..	92
PAUL E. STEINER, ROBERT STEELE, and F. C. KOCH. The Possible Carcinogenicity of Overcooked Meats, Heated Cholesterol, Acrolein, and Heated Sesame Oil.....	100
GEORGE R. SHARPLESS. Diet and Epithelial Hyperplasia in the Forestomach of Rats and Mice.....	108
G. C. MUELLER and H. P. RUSCH. Irradiated Benzpyrene and Inhibition of Urease Activity...	113
B. E. KLINE. The Effect of <i>p</i> -Dimethylaminoazobenzene on the Formation of Blood Proteins.	117
PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR CANCER RESEARCH, INC.	
Thirty-Fifth Annual Meeting. Boston, Mass., March 30-April 1, 1942.....	120-139
Proceedings of Scientific Sessions.....	120-136
Proceedings of Business Sessions.....	137-139
ABSTRACTS.....	140-144
Reports of Experimental Research.....	140-142
Clinical and Pathological Reports.....	143-144

MARCH, 1943. NUMBER 3

I. BERENBLUM and R. SCHOENTAL. The Metabolism of 3,4-Benzpyrene in Mice and Rats. I. The Isolation of a Hydroxy and a Quinone Derivative, and a Consideration of Their Biological Significance.....	145
---	-----

I. BERENBLUM, D. CROWFOOT, E. R. HOLIDAY, and R. SCHOENTAL. The Metabolism of 3,4-Benzpyrene in Mice and Rats. II. The Identification of the Isolated Products as 8-Hydroxy-3,4-Benzpyrene and 3,4-Benzpyrene-5,8-Quinone	151
HELEN QUINCY WOODARD. The Glycerophosphatases of the Rat Liver Cancer Produced by Feeding <i>p</i> -Dimethylaminoazobenzene	159
MORRIS BELKIN and KURT G. STERN. Metabolism of Yale Carcinoma I	164
E. ELIZABETH JONES. The Effect of 2,7-Dihydroxynaphthalene on Tumor Incidence and Growth of the Mammary Gland in Mice of the Line A Albino and C3H Strains	168
JAMES B. MURPHY and ERNEST STURM. The Effect of Sodium Pentobarbital, Paradichlorobenzene, Amyl Acetate, and Sovasol on Induced Resistance to a Transplanted Leukemia of the Rat	173
ALFRED PLAUT and ALICE C. KOHN-SPEYER. The Skin Tunnel. A Device for Keeping Substances in Contact with the Skin	176
JULES C. ABELS, GEORGE T. PACK, and C. P. RHOADS. Metabolic Studies in Patients with Cancer of the Gastrointestinal Tract. XVII. The Conjugation of Phenols	177
HOWARD C. TAYLOR, JR., FLORA E. MECKE, and GRAY H. TWOMBLY. Estrogen and 17-Ketosteroid Excretion in Patients with Breast Carcinoma	180
LAWRENCE S. MANN and WILLIAM H. WELKER. Further Studies of Specific Precipitin Antisera for the Protein of Cancer Tissue. I	193
LAWRENCE S. MANN and WILLIAM H. WELKER. Further Studies of Specific Precipitin Antisera for the Protein of Cancer Tissue. II. The Application of <i>in Vivo</i> Absorption	196
BERNHARD ZONDEK, FELIX MANDL, FELIX SULMAN, ARON BREZEZINSKI, and HERTHA GABRIELE TIETZ. Heterotransplantation of Human Pseudomyxoma Peritonei into Mice and Rats	198
ABSTRACTS	206-216
Reports of Experimental Research	206-210
Clinical and Pathological Reports	211-216

APRIL, 1943. NUMBER 4

J. A. MILLER and C. A. BAUMANN. The Effect of Naphthacene on the Fluorescence of Hydrocarbons	217
J. A. MILLER and C. A. BAUMANN. Factors That Alter the Fluorescence of Certain Carcinogens	223
ARTHUR A. NELSON, O. GARTH FITZHUGH, and HERBERT O. CALVERY. Liver Tumors Following Cirrhosis Caused by Selenium in Rats	230
JOSEPH G. HOFFMAN, H. L. GOLTZ, M. C. REINHARD, and STANLEY G. WARNER. Quantitative Determination of the Growth of a Transplantable Mouse Adenocarcinoma	237
KARL T. NEUBUERGER and C. L. DAVIS. Cerebral Tumor in a Dog Resembling Human Medulloblastoma	243
CARL REICH and W. F. DUNNING. Studies on the Morphology of the Peripheral Blood of Rats. I. Normal Rats	248
W. F. DUNNING and CARL REICH. Studies on the Morphology of the Peripheral Blood of Rats. II. Rats Injected Subcutaneously with Carcinogenic Hydrocarbons	258
W. F. DUNNING and CARL REICH. Studies on the Morphology of the Peripheral Blood of Rats. III. Rats with Induced and Transplanted Tumors	266
ABSTRACTS	275-280
Reports of Experimental Research	275-278
Clinical and Pathological Reports	279-280

MAY, 1943. NUMBER 5

GLADYS CAMERON, M. J. KOPAC, and ROBERT CHAMBERS. Neoplasm Studies. IX. The Effects in Tissue Culture of N,N-Dimethyl- <i>p</i> -Phenylenediamine on Rat Liver Tumors Induced by <i>p</i> -Dimethylaminoazobenzene	281
M. J. KOPAC, GLADYS CAMERON, and ROBERT CHAMBERS. Neoplasm Studies. X. The Effects in Tissue Culture of Some Split Produces of <i>p</i> -Dimethylaminoazobenzene on Rat Liver Tumors	290

Contents of Volume 3

v

ROBERT CHAMBERS, GLADYS CAMERON, and M. J. KOPAC. Neoplasm Studies. XI. The Effects in Tissue Cultures of N,N,N',N'-Tetramethyl- <i>o</i> -Phenylenediamine and Other Compounds on Malignant Lymph Nodes.....	293
D. L. MINER, J. A. MILLER, C. A. BAUMANN, and H. P. RUSCH. The Effect of Pyridoxin and Other B Vitamins on the Production of Liver Cancer with <i>p</i> -Dimethylaminoazobenzene	296
H. G. ALBAUM and V. R. POTTER. Biocatalysts in Cancer Tissue. II. Inhibition of the Succinoxidase System by Tumor Extracts.....	303
LUIS VARGAS, JR. Experimental Fibroids in Hypophysectomized Female Guinea Pigs.....	309
WALTER J. BURDETTE. The Inheritance of Susceptibility to Tumors in Mice. II. Tumors Induced by Methylcholanthrene in the Progeny of C3H and JK Mice.....	318
CHARLES T. OLCOTT and GEORGE N. PAPANICOLAOU. Studies on Spontaneous Tumors in Guinea Pigs. III. A Chondrosarcoma of the Iliac Bone with Metastasis to the Mammary Region	321
LUDWIK GROSS. Intradermal Immunization of C3H Mice against a Sarcoma That Originated in an Animal of the Same Line.....	326
SHIELDS WARREN. The Distribution of Doses of Radioactive Phosphorus in Leukemic Patients	334
ABSTRACTS	337-349
Reports of Experimental Research.....	337-343
Clinical and Pathological Reports.....	344-349
BOOK REVIEWS	350

JUNE, 1943. NUMBER 6

W. C. SCHNEIDER and V. R. POTTER. Biocatalysts in Cancer Tissue. III. Succinic Dehydrogenase and Cytochrome Oxidase.....	353
VAN R. POTTER. Biocatalysts in Cancer Tissue. IV. An Enzyme-Virus Theory Regarding Carcinogenesis	358
W. L. SIMPSON and W. CRAMER. Fluorescence Studies of Carcinogens in Skin. I. Histological Localization of 20-Methylcholanthrene in Mouse Skin after a Single Application	362
L. A. STRAIT, E. L. McCAWLEY, and I. H. PERRY. A Spectrochemical Study of Estrogen-Induced Mammary Cancer in Mice. I. Chemical Preparation of Tissue and Analysis by Spectrophotometry	370
I. H. PERRY, L. A. STRAIT, and E. L. McCAWLEY. A Spectrochemical Study of Estrogen-Induced Mammary Cancer in Mice. II. Distribution of Triphenylethylene in the Mamma and in Mammary Cancer Induced by This Estrogen	378
PAUL E. STEINER. The Incidence of a Carcinogenic Factor in the Livers of Cancer, Noncancer, Cirrhotic, and Negro Patients	385
GEORGE D. SNELL and ARTHUR M. CLOUDMAN. The Effect of Rate of Freezing on the Survival of Fourteen Transplantable Tumors of Mice	396
DANIEL LASZLO and CECILIE LEUCHTENBERGER. A Rapid Test for Tumor Growth Inhibitors ..	401
JOHN J. BIESELE. Diplochromosomes in a Goldfish Tumor.....	411
ABSTRACTS	413-424
Reports of Experimental Research	413-418
Clinical and Pathological Reports.....	418-424

JULY, 1943. NUMBER 7

J. A. BAIN and H. P. RUSCH. Carcinogenesis with Ultraviolet Radiation of Wave Length 2,800-3,400 Å	425
V. SUNTZEFF and CHRISTOPHER CARRUTHERS. The Effect of Methylcholanthrene upon Epidermal Sodium and Calcium.....	431
HARRY S. N. GREENE. The Occurrence and Transplantation of Embryonal Nephromas in the Rabbit	434
JOHN J. BITTNER. Mammary Cancer in Fostered and Unfostered C3H Breeding Females and Their Hybrids	441

IRVING ARIEL, FRANCIS W. BISHOP, and STAFFORD L. WARREN. Studies on the Effect of Hypothermia. I. Acute Physical and Physiological Changes Induced by the Prolonged Hypothermic State in the Rabbit.....	448
IRVING ARIEL and STAFFORD L. WARREN. Studies on the Effect of Hypothermia. II. The Active Role of the Thyroid Gland in Hypothermic States in the Rabbit.....	454
IRVING ARIEL and STAFFORD L. WARREN. Studies on the Effect of Hypothermia. III. The Effect of a Single Short Period of Hypothermia on the Brown-Pearce Rabbit Epithelioma..	464
LUVILLE T. STEADMAN, IRVING ARIEL, and STAFFORD L. WARREN. Studies on the Effect of Hypothermia. IV. The Rise of Serum Magnesium in Rabbits during the Hypothermic States as Shown by the Spectrochemical Method.....	471
AMERICAN ASSOCIATION FOR CANCER RESEARCH, INC.	
Special Meeting of the Board of Directors, February 12, 1943.....	475-476
By-Laws of the Association.....	477-479
List of Members of the Association.....	480-485
ABSTRACTS.....	486-493
Experimental Research, Animal Tumors.....	486-490
Clinical and Pathological Reports.....	491-493
BOOK REVIEWS.....	494-496

AUGUST, 1943. NUMBER 8

J. M. WOLFE and A. W. WRIGHT. A Comparative Histological Study of the Anterior Hypophysis and the Ovaries of Two Strains of Rats, One of Which Is Characterized by a High Incidence of Mammary Fibroadenoma.....	497
DAVID A. WOOD and H. H. DARLING. A Cancer Family Manifesting Multiple Occurrences of Bilateral Carcinoma of the Breast.....	509
W. L. SIMPSON and W. CRAMER. Sebaceous Glands and Experimental Skin Carcinogenesis in Mice.....	515
A. H. M. KIRBY. Attempts to Induce Stomach Tumors. I. The Effect of Cholesterol Heated to 300° C.....	519
DALE REX COMAN. Human Neoplasms in Tissue Culture. II. Observations upon Cells Derived from Peritoneal and Pleural Effusions.....	526
WARREN H. LEWIS. Nucleolar Vacuoles in Living Normal and Malignant Fibroblasts.....	531
ALFRED TAYLOR, R. E. HUNGATE, and D. RUSSELL TAYLOR. Yolk Sac Cultivation of Tumors..	537
D. RUSSELL TAYLOR, MARGUERITE McAFEE, and ALFRED TAYLOR. The Effect of Yolk Sac-Cultivated Tumors on the Hemoglobin Level in the Embryonic Chick.....	542
MORGAN HARRIS. The Growth of Alien Strain Tumors in Parabiotic Mice.....	546
ALEXANDER BRUNDSCHWIG. Vitamin C and Tumor Growth.....	550
ABSTRACTS.....	554-568
Experimental Research, Animal Tumors.....	554-561
Clinical and Pathological Reports.....	561-568

SEPTEMBER, 1943. NUMBER 9

F. DURAN-REYNALS. The Infection of Turkeys and Guinea Fowls by the Rous Sarcoma Virus and the Accompanying Variations of the Virus.....	569
JOHN J. MILFORD and F. DURAN-REYNALS. Growth of a Chicken Sarcoma Virus in the Chick Embryo in the Absence of Neoplasia.....	578
E. TENENBAUM and L. DOLJANSKI. Studies on Rous Sarcoma Cells Cultivated <i>in Vitro</i> . II. Morphologic Properties of Rous Sarcoma Cells.....	585
W. L. SIMPSON and W. CRAMER. Further Observations on Skin Carcinogenesis by a Single Application of 20-Methylcholanthrene.....	604
CHARLES E. DUNLAP and SHIELDS WARREN. The Carcinogenic Activity of Some New Derivatives of Aromatic Hydrocarbons.....	606
L. DMOCHOWSKI. On the Reported Production of Tumors by Normal Liver Cells of Mice Bearing Tumors Produced by Methylcholanthrene.....	608
J. A. BAIN, H. P. RUSCH, and B. E. KLINE. The Effect of Temperature upon Ultraviolet Carcinogenesis with Wave Lengths 2,800-3,400 Å.....	610

Contents of Volume 3

vii

ROBERT BRIGGS and RONALD GRANT. Growth and Regression of Frog Kidney Carcinoma Transplanted into the Tails of Permanent and Normal Tadpoles.....	613
CHARLES O. WARREN. Tissue Metabolism Studies on Bone Marrow. Consideration in Relation to Tumor Metabolism.....	621
ABSTRACTS.....	626-648
Experimental Research, Animal Tumors.....	626-632
Clinical and Pathological Reports.....	633-648

OCTOBER, 1943. NUMBER 10

RAYMOND G. GOTTSCHALK. Observations on a Chemically Induced Chicken Tumor Containing an Antigen Related to That of a Leukosis Sarcoma Agent.....	649
W. CRAMER and R. E. STOWELL. On the Quantitative Evaluation of Experimental Skin Carcinogenesis by Methylcholanthrene. The Factors of Dosage, Time, Spacing of Applications, and the Multiplicity of the Carcinogenic Response.....	668
HILDEGARDE ARNOLD and H. M. ZIMMERMAN. Experimental Brain Tumors. III. Tumors Produced with Dibenzanthracene.....	682
I. BERENBLUM and R. SCHOENTAL. The Metabolism of 1,2-Benzanthracene in Mice and Rats. With an Appendix on Absorption Spectra by E. R. Holiday.....	686
EDWARD L. BURNS and JOHN R. SCHENKEN. Spontaneous Primary Hepatomas in Mice of Strain C3H. II. The Influence of Breeding on Their Incidence.....	691
JOHN R. SCHENKEN and EDWARD L. BURNS. Spontaneous Primary Hepatomas in Mice of Strain C3H. III. The Effect of Estrogens and Testosterone Propionate on Their Incidence.....	693
EDWARD L. BURNS and JOHN R. SCHENKEN. Spontaneous Primary Hepatomas in Mice of Strain C3H. IV. A Study of Intracytoplasmic Inclusion Bodies of Mitochondria.....	697
B. E. KLINE and H. P. RUSCH. Tumor Inhibitor Studies. II. The Effect of Plant Hormones on Tumor Growth.....	702
ABSTRACTS.....	706-728
Experimental Research, Animal Tumors.....	706-711
Clinical and Pathological Reports.....	712-728

NOVEMBER, 1943. NUMBER 11

C. M. FLORY, J. FURTH, J. A. SAXTON, and L. REINER. Chemotherapeutic Studies on Transmitted Mouse Leukemia.....	729
CHRISTOPHER CARRUTHERS and V. SUNTZEFF. Chemical Studies on the Mode of Action of Methylcholanthrene on Mouse Epidermis.....	744
P. S. LAVIK and C. A. BAUMANN. Further Studies on the Tumor-Promoting Action of Fat.....	749
W. U. GARDNER. Spontaneous Testicular Tumors in Mice.....	757
CARROLL A. PFEIFFER and CHARLES W. HOOKER. Testicular Changes Resembling Early Stages in the Development of Interstitial Cell Tumors in Mice of the A Strain after Long-Continued Injections of Pregnant Mare Serum.....	762
OTTO SAPHIR and MAX APPEL. Attempts to Abrogate Immunity to the Brown-Pearce Carcinoma.....	767
LUDWIK GROSS. The Importance of Dosage in the Intradermal Immunization against Transplantable Neoplasms.....	770
JOHN J. BIESELE and HERBERT POYNER. Polytene Chromosomes in Two Mammary Carcinomas of the Human Subject.....	779
ABSTRACTS.....	784-808
Experimental Research, Animal Tumors.....	784-786
Clinical and Pathological Reports.....	787-808

DECEMBER, 1943. NUMBER 12

HARRY S. N. GREENE. The Heterologous Transplantation of Embryonic Mammalian Tissues.....	809
C. J. KENSLE, C. WADSWORTH, K. SUGIURA, C. P. RHOADS, KARL DITTMER, and V. DU VIGNEAUD. The Influence of Egg White and Avidin Feeding on Tumor Growth.....	823

B. E. KLINE, H. P. RUSCH, C. A. BAUMANN, and P. S. LAVIK. The Effect of Pyridoxine on Tumor Growth	825
WILLIAM M. CAHILL, W. F. DUNNING, and ARTHUR H. SMITH. Free Choice Dietary Study of Tumor-Bearing Rats	830
ALFRED GOERNER and M. MARGARET GOERNER. Vitamin A and the Toxic Action of Dibenzanthracene on the Tissues	833
ROBERT M. HILL, ARNOLD G. WARE, and FRED H. SCHULTZ. A Technic for the Production of Hypothermia in Albino Rats	839
ROBERT M. HILL, ENID K. RUTLEDGE, ARNOLD G. WARE, FRED H. SCHULTZ, and WALLACE H. LIVINGSTON. The Effects of Lowered Body Temperatures on Methylcholanthrene Fibrosarcomas in Rats	841
J. A. MILLER and C. A. BAUMANN. The Determination of Carcinogenic Hydrocarbons in Animal Tissue. Two-Condition Fluorometry	849
PAUL MYRON APTEKMAN, HELEN DEAN KING, and MARGARET REED LEWIS. A Sarcoma-Producing Factor Extractable from Transplanted Rat Fibrosarcomas	856
EARL T. ENGLE, CECIL KRAKOWER, and C. D. HAAGENSEN. Estrogen Administration to Aged Female Monkeys with No Resultant Tumors	858
WARREN H. LEWIS. Rhabdomyosarcoma. Rat Tumor 92, Institute of Cancer Research, Columbia University, New York	867
SHIELDS WARREN. The Retention of Radioactive Phosphorus in Leukemic Patients	872
ABSTRACTS	877-888
Experimental Research, Animal Tumors	877-882
Clinical and Pathological Reports	883-888
INDEX	889-928